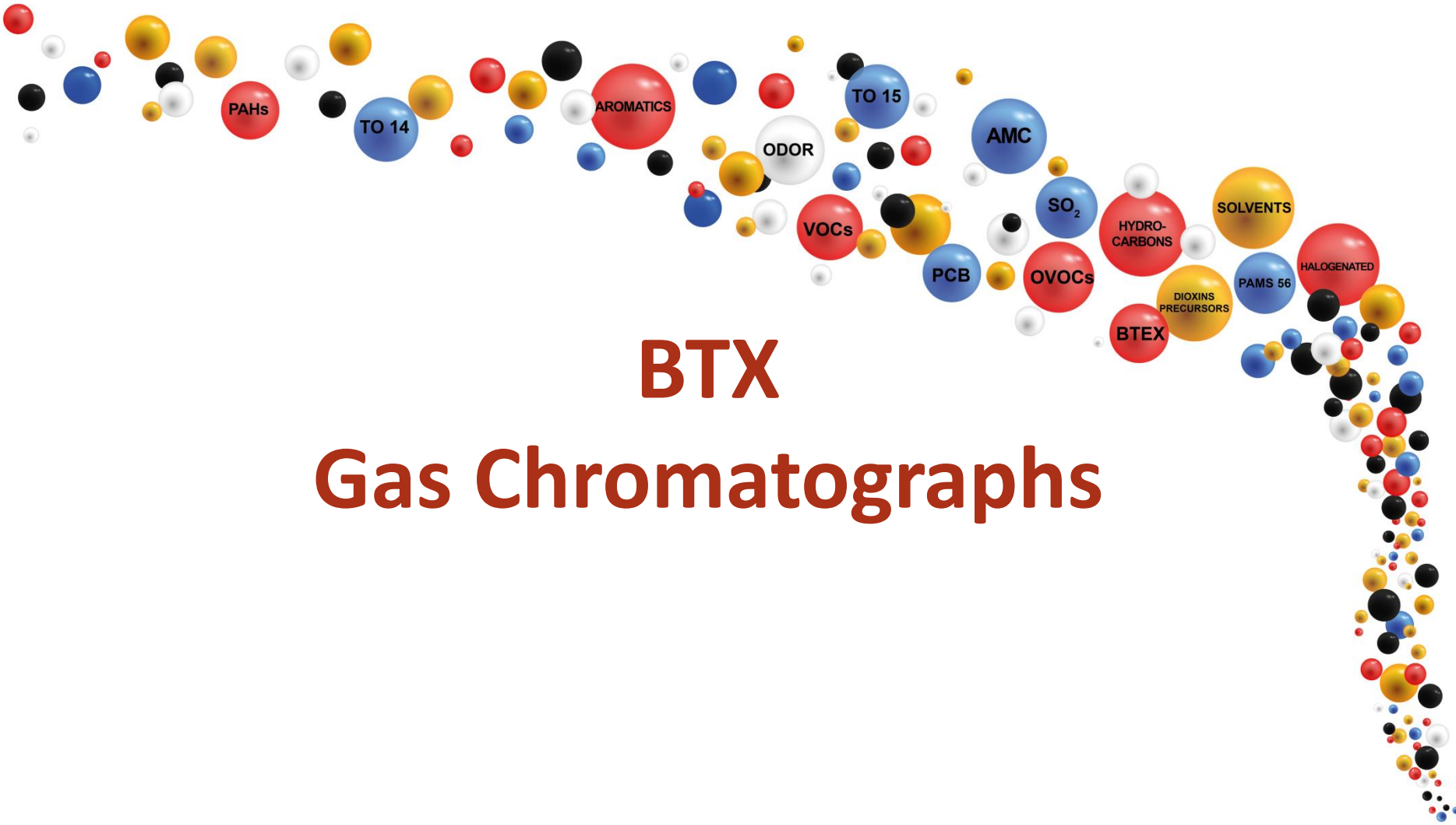
CHROMATOTEC® GROUP

Online Gas Analyzer Experts



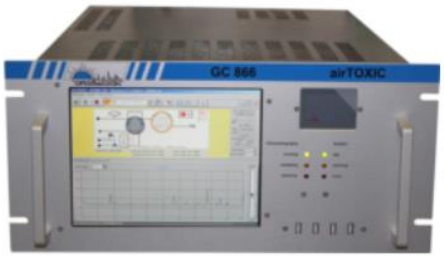
BTX
Gas Chromatographs

Presentation

Online GC-FID

airTOXIC BTEX

PID detector



A GC/PID for automatic monitoring of BTEX. In air, water or soil

airmoVOC BTEX

FID detector

A GC/FID instrument for automatic, continuous monitoring of BTEX in air, water or soil

BTEX in hazardous areas

- airTOXIC auto GC with PID detector for refinery and petrochemical ambient air
- Includes ATEX certification
- Integrated nitrogen generator ATEX certified

airmoVOC BTEX mCERTS / airTOXIC BTEX mCERTS

Analysis of Benzene, Toluene, Ethylbenzene, M+P Xylene, O-Xylene, Cyclohexane and Styrene

In option: Naphtalene, Phenol, 1,3-Butadiene

mCERTS 2015 — Certified EN 14662-3 EN 15267-1 EN 15267-2

Applications

Air quality:

- Urban/Non urban area pollution control
- Indoor measurements
- BTEX / PAMS / CE analysis
- Ambiant air control (PAMS and TO14)
- VOCs Ozone precursors
- Plant / process emissions

Process:

- Industrial Hygiene
- Process efficiency

Other:

- Wastewater plant, Purge and trap (method 502-2 or 524)
- Drinking water

Environment:

- Monitoring of urban and non-urban pollution
- Monitoring of industrial nuisance

Industrial:

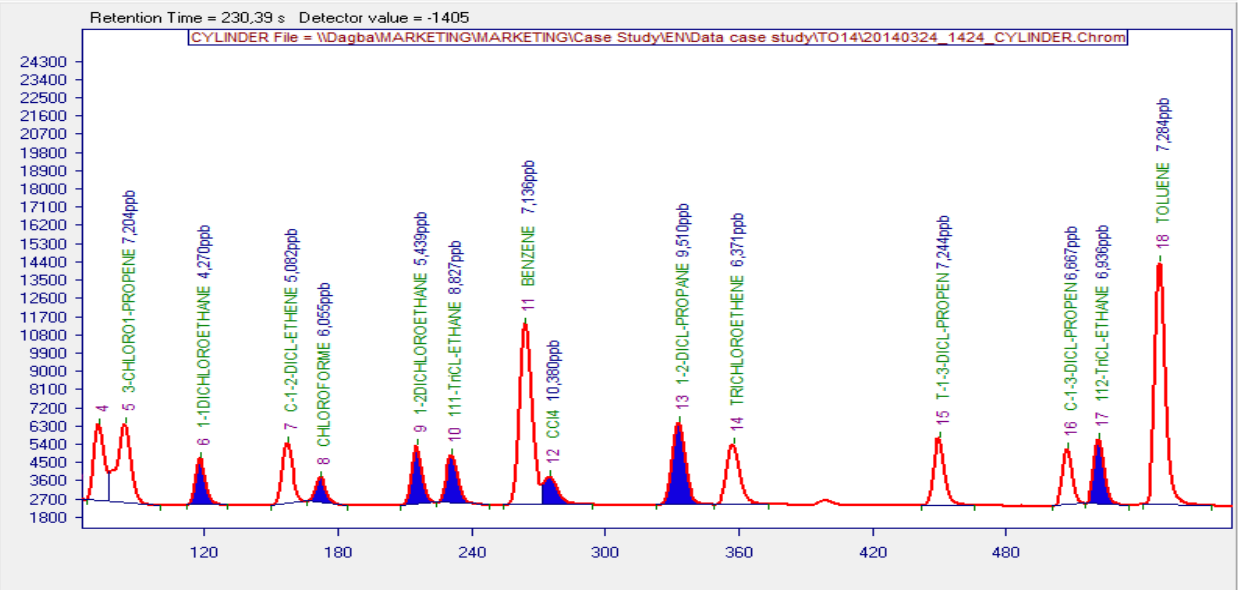
- Industrial health and safety monitoring
- Process Quality Control

BTEX monitoring

FID (airmoVOC) vs PID (airTOXIC)

–PID's UV lamp becomes dirty over time (need of calibration and self cleaning of the lamp)

–FID is the best solution for BTEX monitoring as it is stable, linear, sensitive and selective. It needs H_2 for the flame (gas generators provided to avoid gas cylinders use)

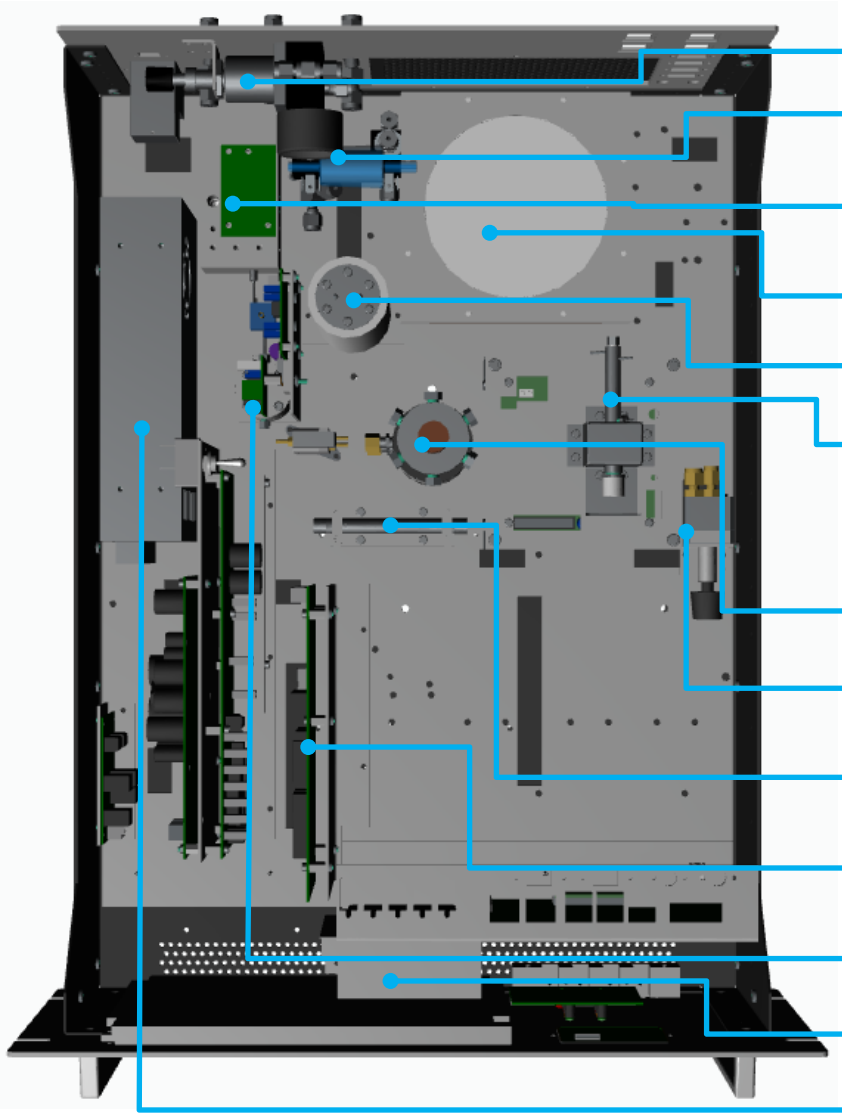


Blue peaks not identified by PID

Summary

- Top view
- Principle
- Installation
- Software
- Calibration
- Service
- Preventive maintenance
- Troubleshooting
- Remote control
- NEW!
- Chromatotec Technical website

Top View – AirmoBTEX (FID)



- Pressure regulator for calibration module
- Coalescent filter
- Critical orifice
- Chromatographic column oven
- Calibration Module
- FID detector
- Pneumatic valve 6 ports
- Air flow regulator for FID
- Sampling Trap
- Electronic boards
- Piezo valve
- Internal computer with Display and Touchpad
- 24 VDC Power supply

Principle – Sampling phase

- The gas sample is drawn by a sampling pump through a trap

- VOCs in the sample are pre-concentrated on the adsorbent present in the trap

- The sampling flow is fixed by a critical orifice

Principle – Injection phase

- The trap is heated to desorb the trapped VOC compounds
- The gaseous sample is introduced in the analytical column by the carrier gas flow (H_2 for AirmoVOC / N_2 for AirToxic)
- VOCs are separated by the analytical column and detected

  - 30m long capillary column
  - Metallic body with apolar stationary phase
  - film thickness: 1 µm, id: 0.28 mm

Principle – Injection phase

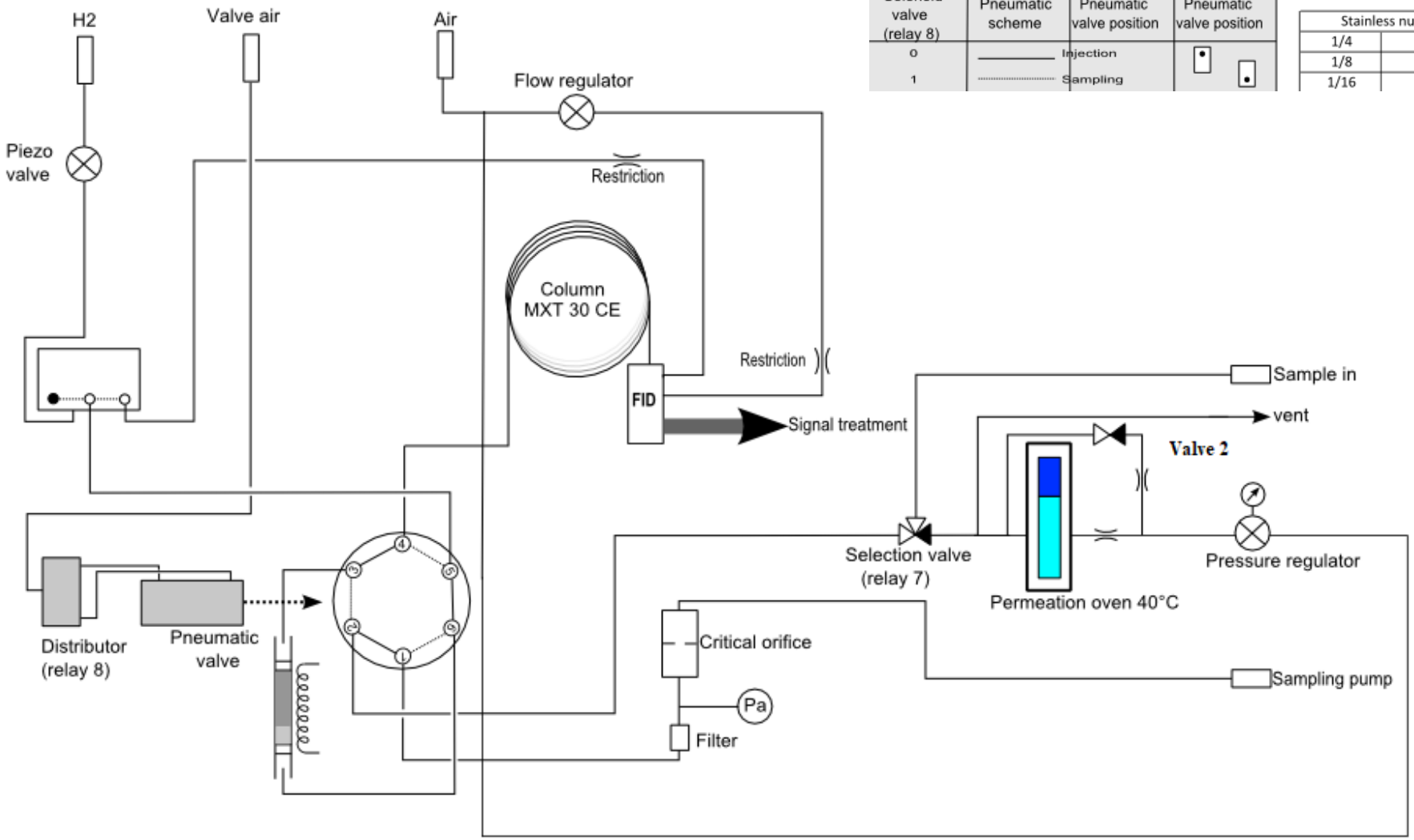
- FID (**F**lame **I**onization **D**etector):
  - Ions are formed during combustion of organic compounds in a hydrogen/air flame
  - The ions produce an electrical current = detector signal
  - The signal is recorded between the 2 electrodes
- PID (**P**hoto **I**onization **D**etector) :

  - Molecules are broken, bombarded by high energy UV photons (emitted by the lamp)
  - Creation of positive ions (cations) → production of an electrical current
  - This signal (current) is recorded between the 2 electrodes

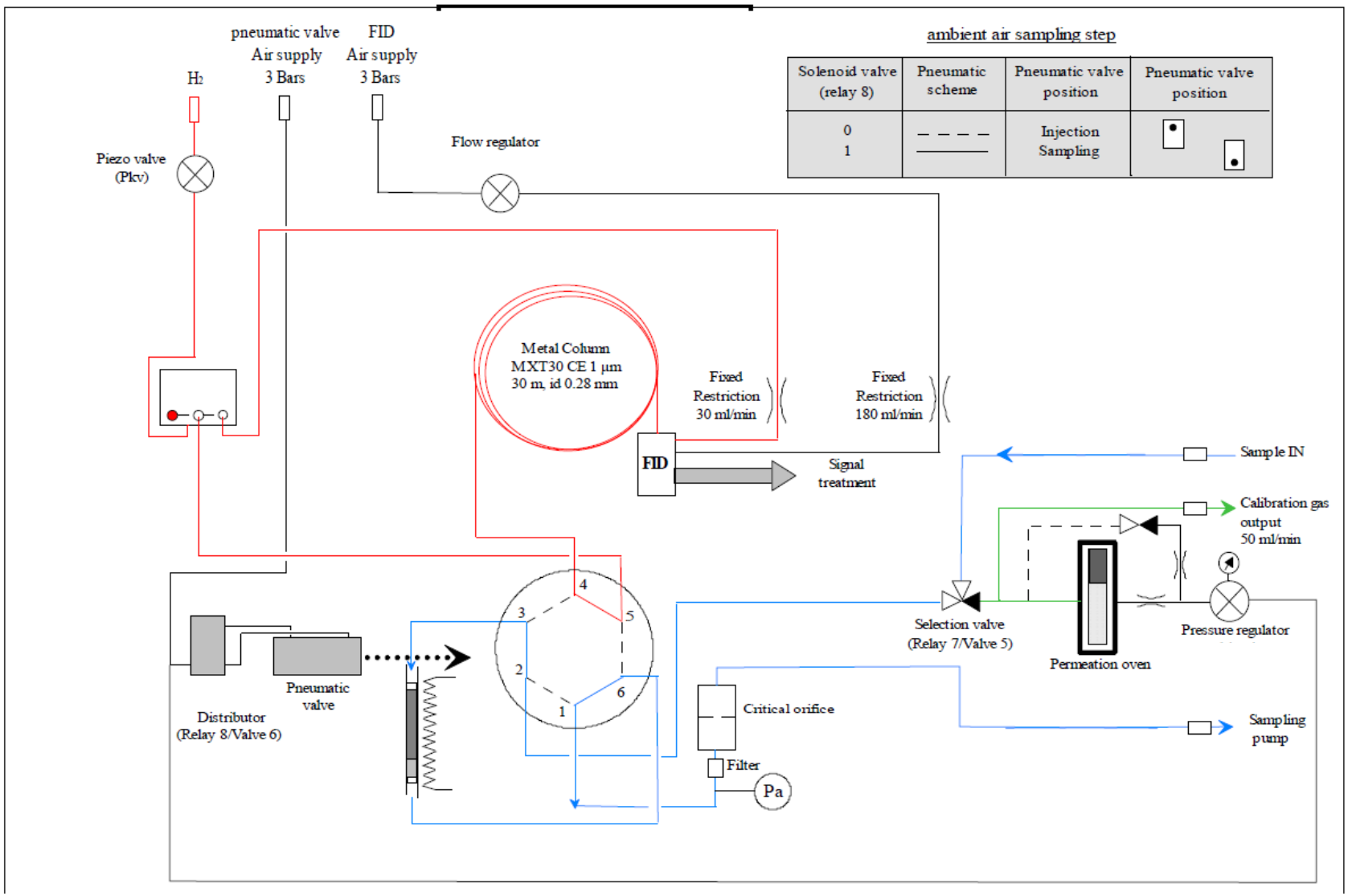
Principle. FID: Pneumatic scheme

Solenoid valve (relay 8)	Pneumatic scheme	Pneumatic valve position	Pneumatic valve position
0	Injection		
1	Sampling		

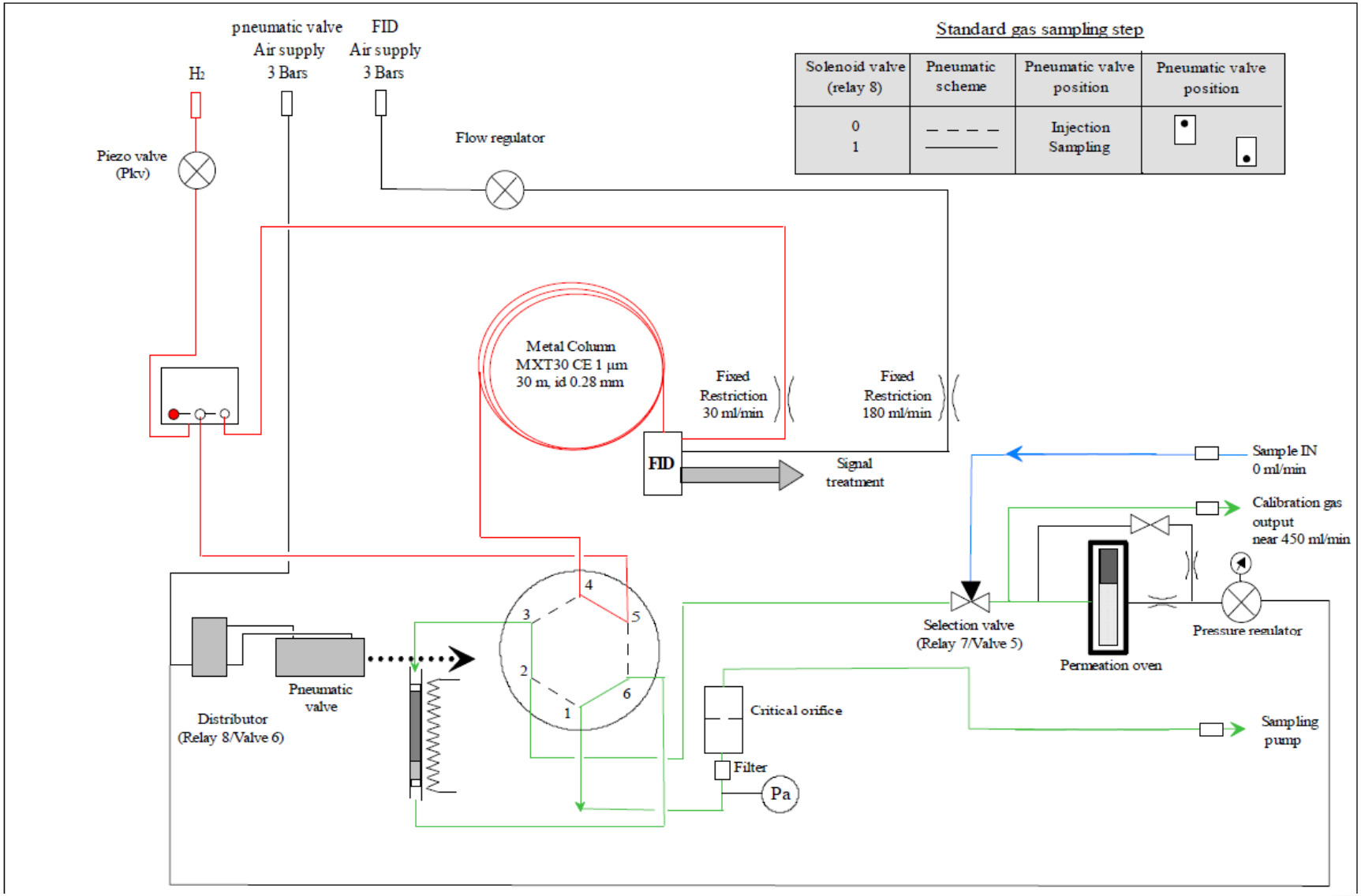
Stainless nut	
1/4	1
1/8	3
1/16	1



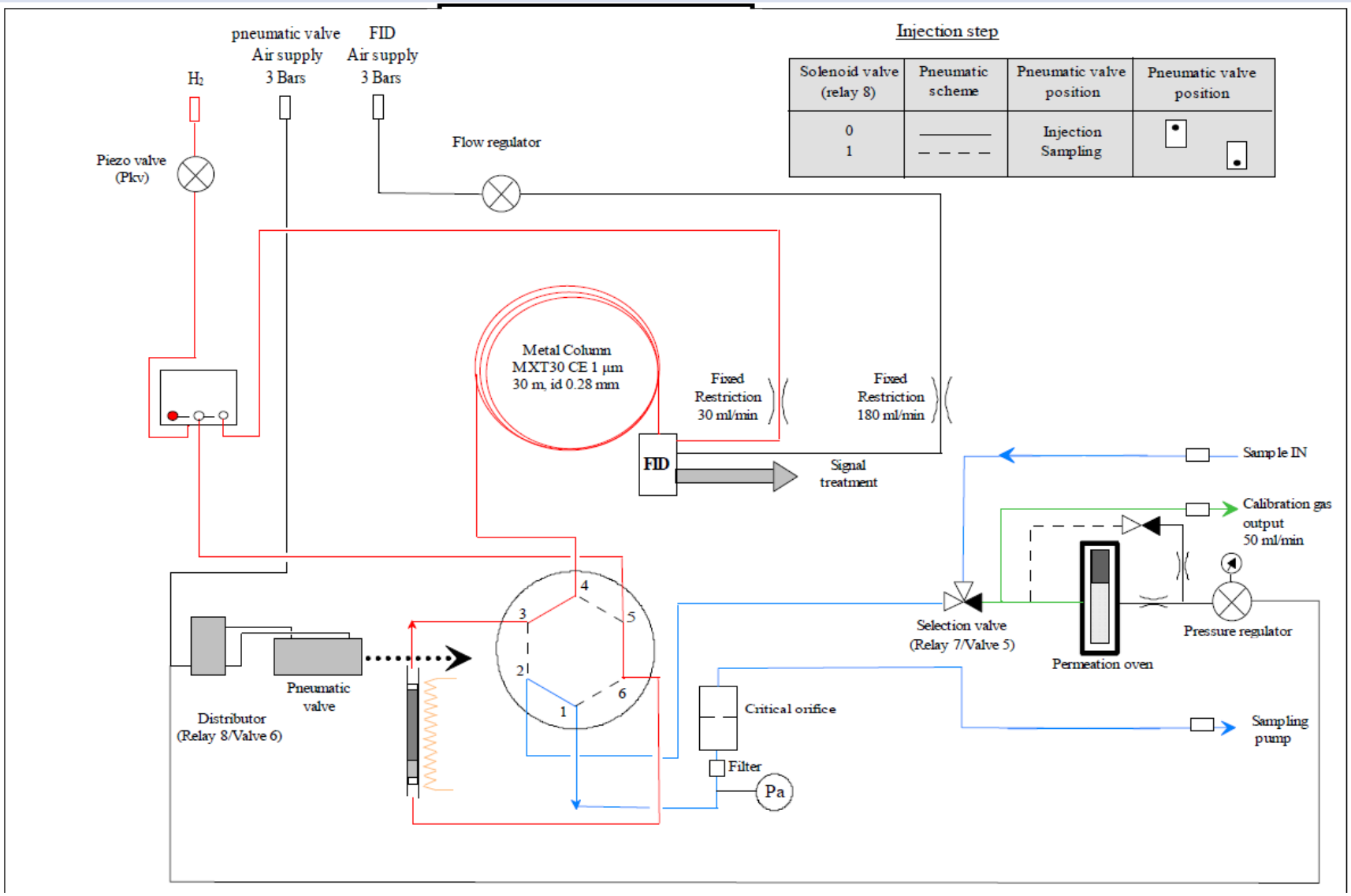
Principle. FID: Ambient air sampling



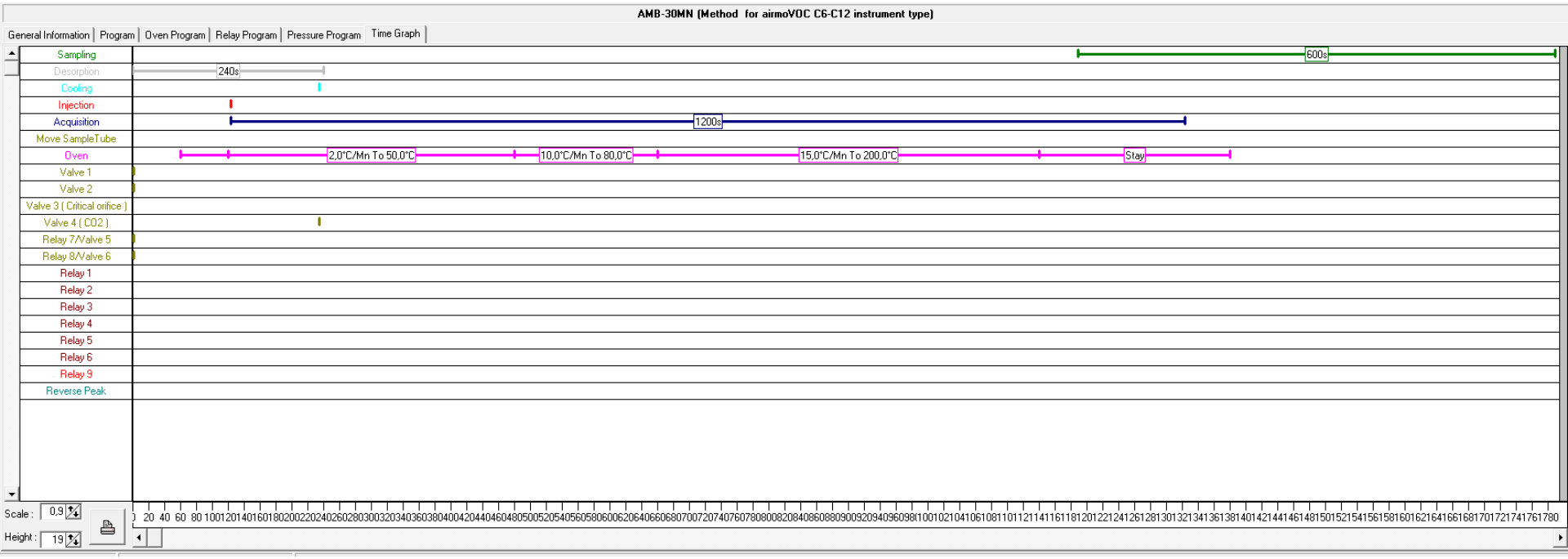
Principle. FID: Standard gas sampling



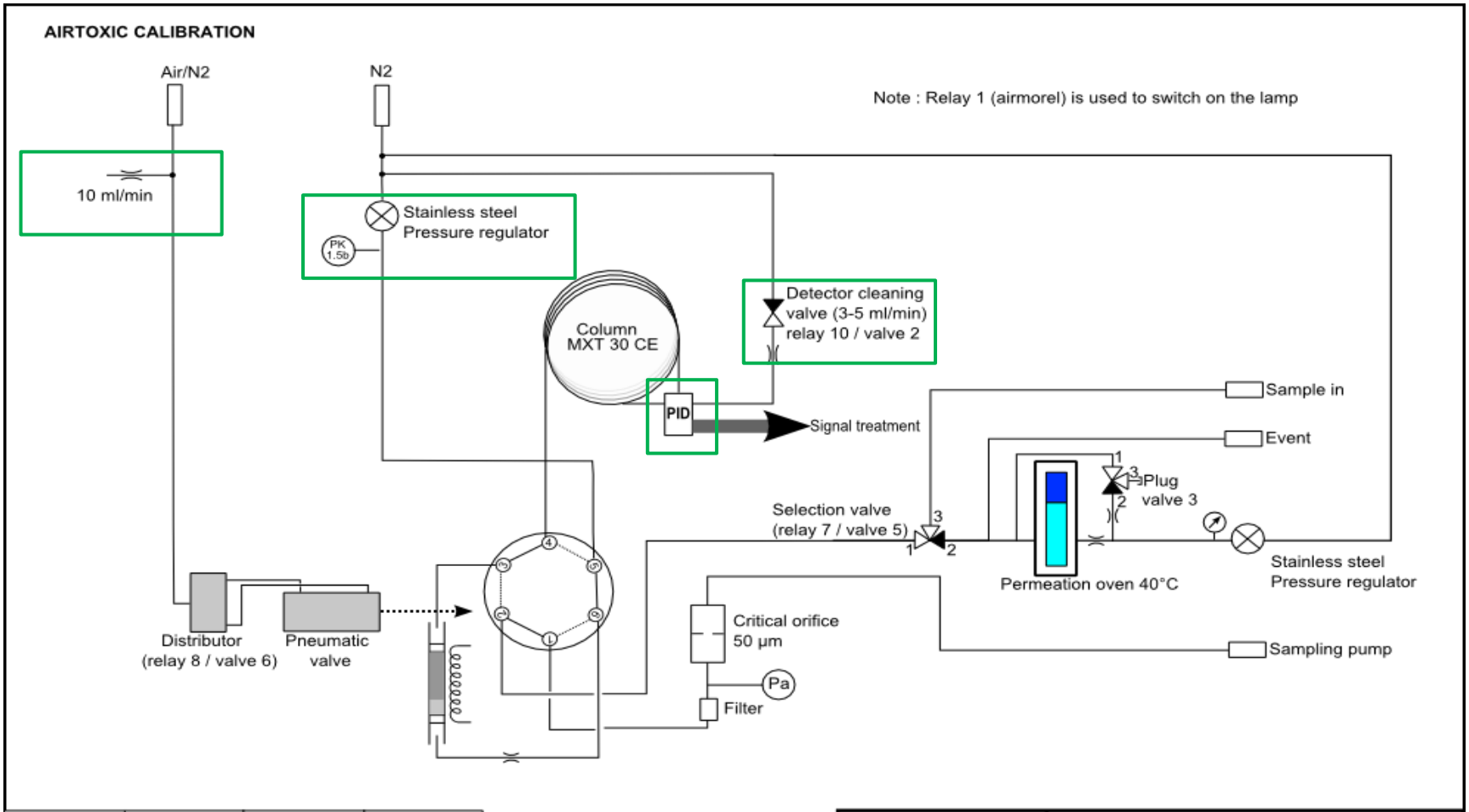
Principle. FID: Injection & Thermodesorption



Principle. FID: Analysis cycle



Principle. PID



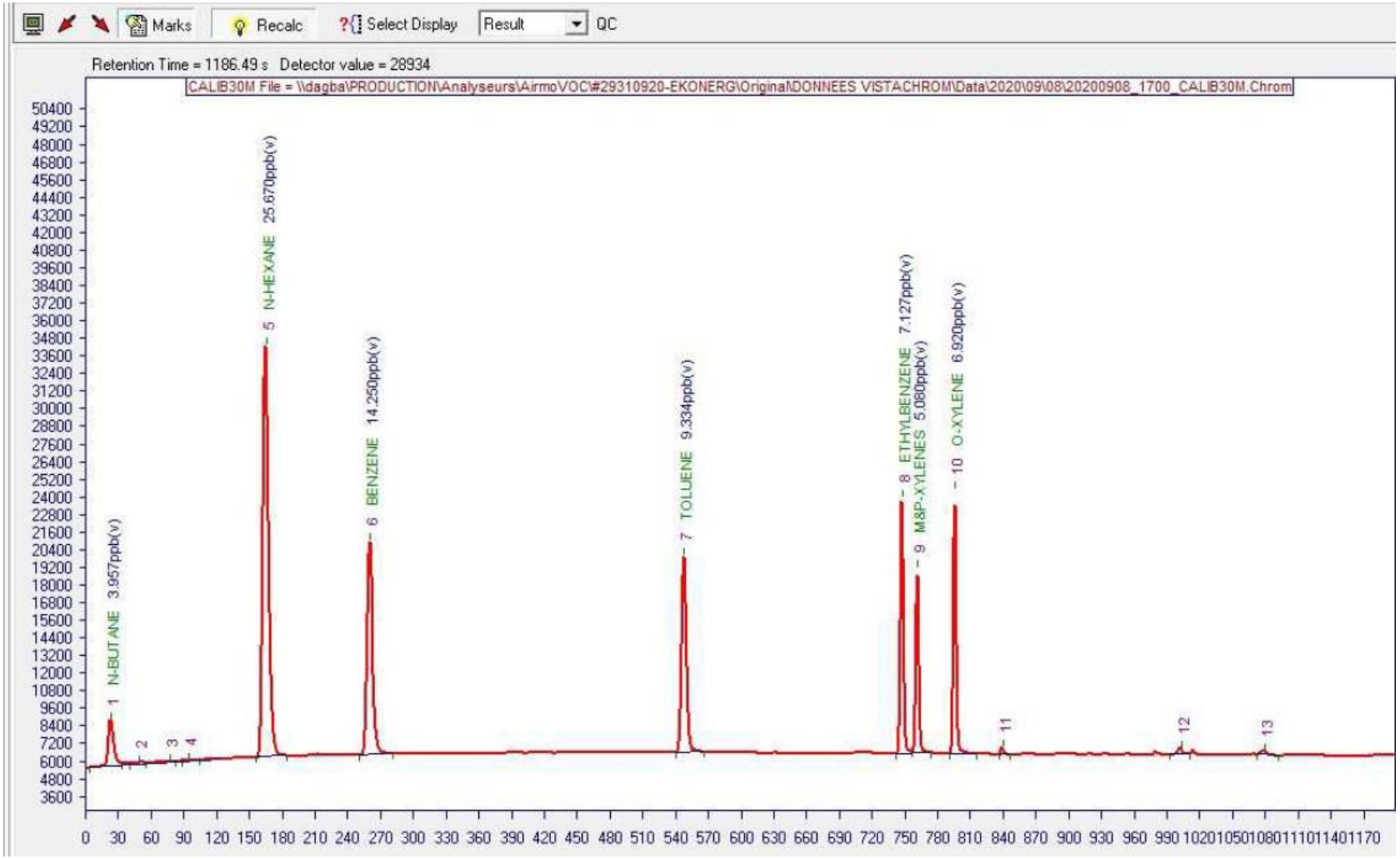
Solenoid valve (relay 8)	Pneumatic scheme	Pneumatic valve position	Pneumatic valve position
0	———	Injection	
1	.....	Sampling	

Stainless nut	
1/4	1
1/8	3
1/16	0

CHROMATOTEC GROUP	SCHEMA PRINCIPE AIRTOXIC CALIBRATION		
15 Rue d'Artiguelongue 33240 SAINT ANTOINE FRANCE	Spr/AIR/00021	005	29/05/19

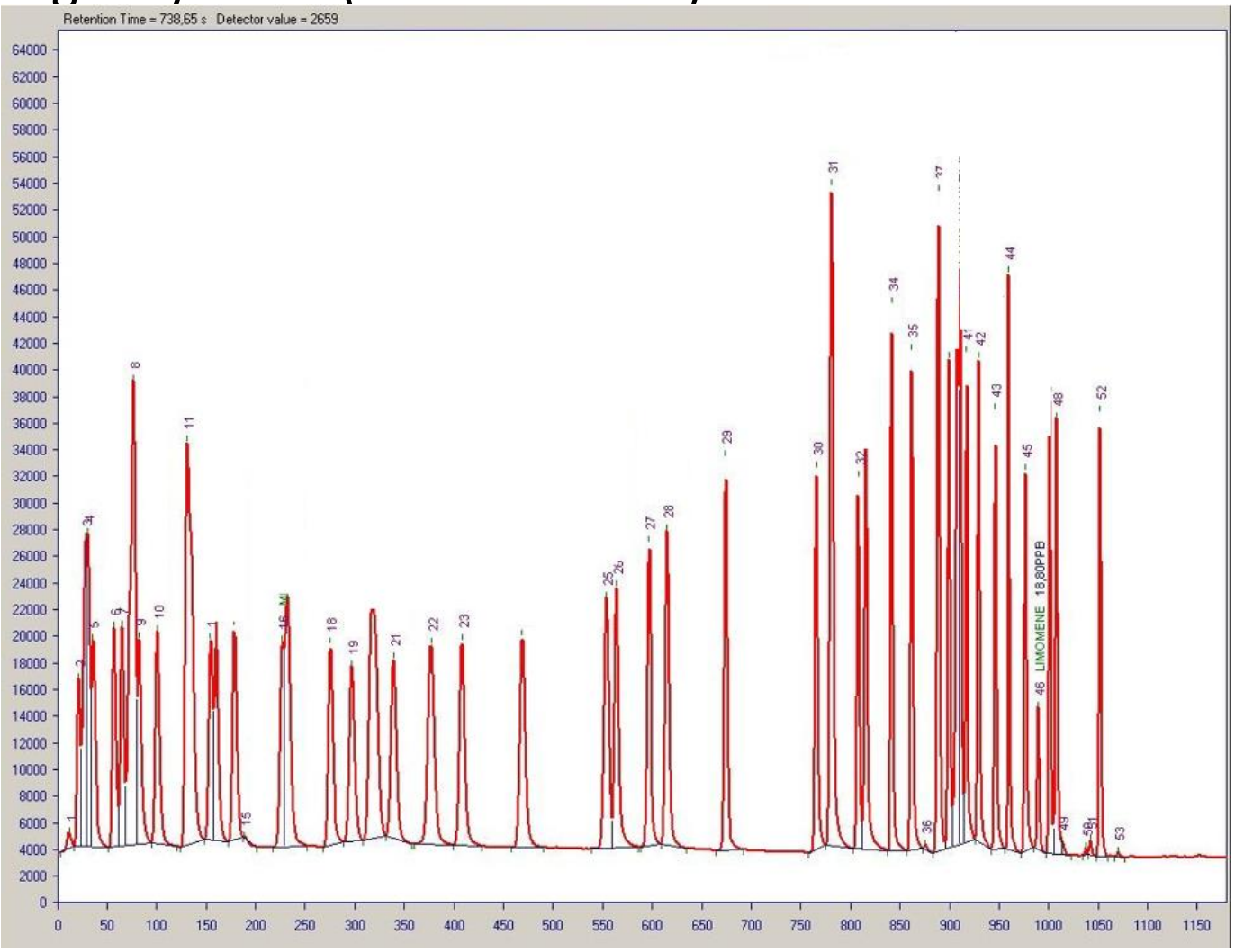
Principle. FID: Chromatograms

Permeation oven flushed with N_2



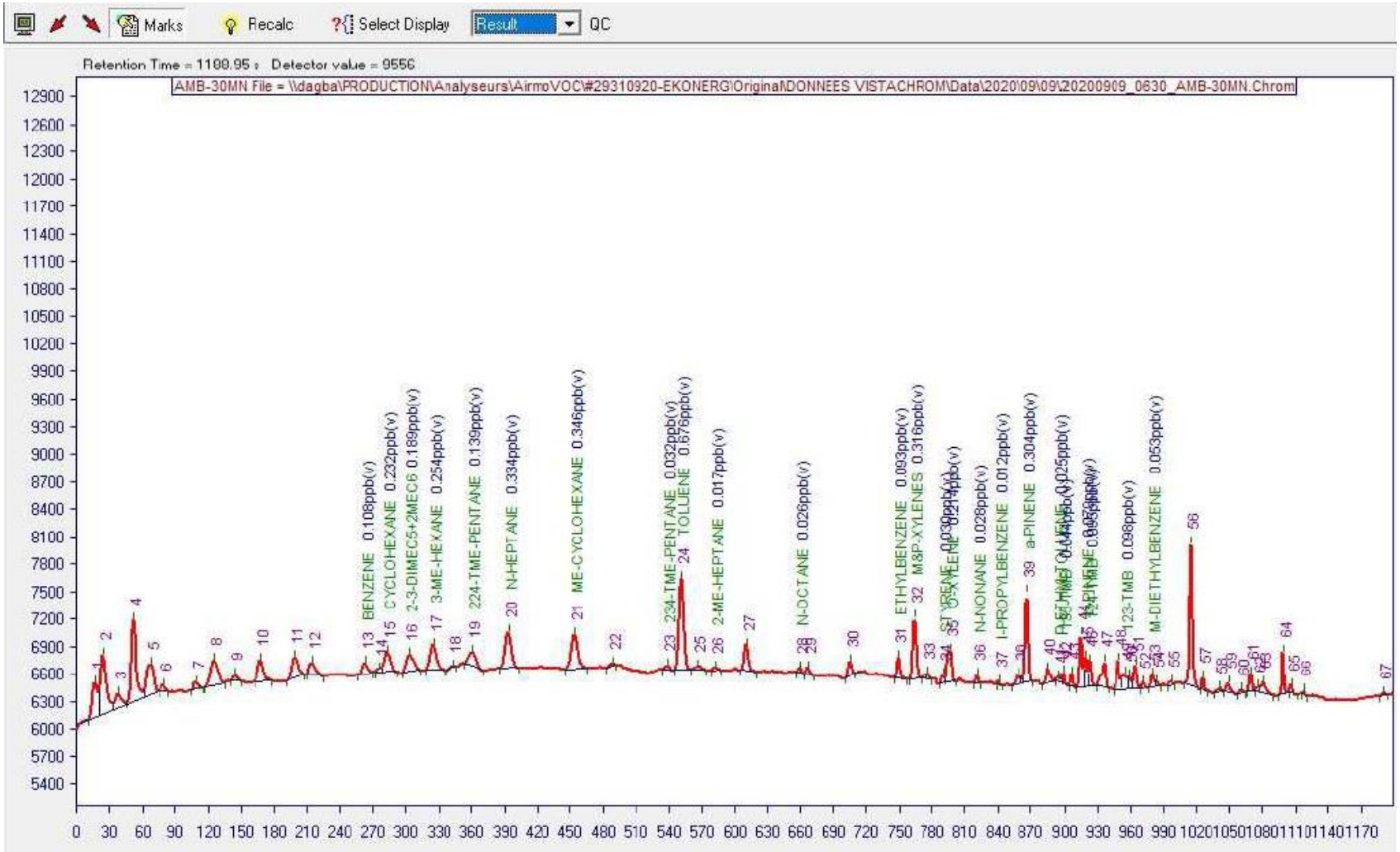
Principle. FID: Chromatograms

Standard gas cylinder (PAMS mixture)



Principle. FID: Chromatograms

Ambient air analysis



Installation

GAS	He (5.5)	H_2 (Generator)	N_2 (5.5)	Ar (6.0)	Zero air
Inlet pressure	-----	2 Bars	-----	-----	-----
Using pressure	-----	409 (+/-5) hPa at 36°C	-----	-----	-----
Flowrate (ml/min)	-----	Carrier gas ≈ 3 / FID 27.5	-----	-----	FID 3 Bars / Hydroxychrom 3 Bars / Pneumatic Valve 4 Bars / Permeation oven ≈ 0.4 Bar; FID 180 / Hydroxychrom 176 / Pneumatic Valve ---- / Permeation oven 53.97 or 245.0

- Before unboxing the instrument
  - Read the QC report (most important document)
  - Read the easy start document
  - Purge the gas generators during one hour! (generator not connected to the GC)
  - Purge your sampling line during 1 hour ! (sampling line not connected to the GC)
  - Wisely select the location for the instrument : no vibration, smooth Air Conditionning…

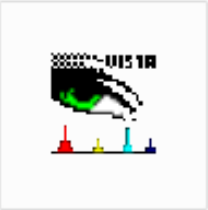
The damages created by skipping the purge of the generators will not be covered by the warranty!

Software

Vistachrom Software

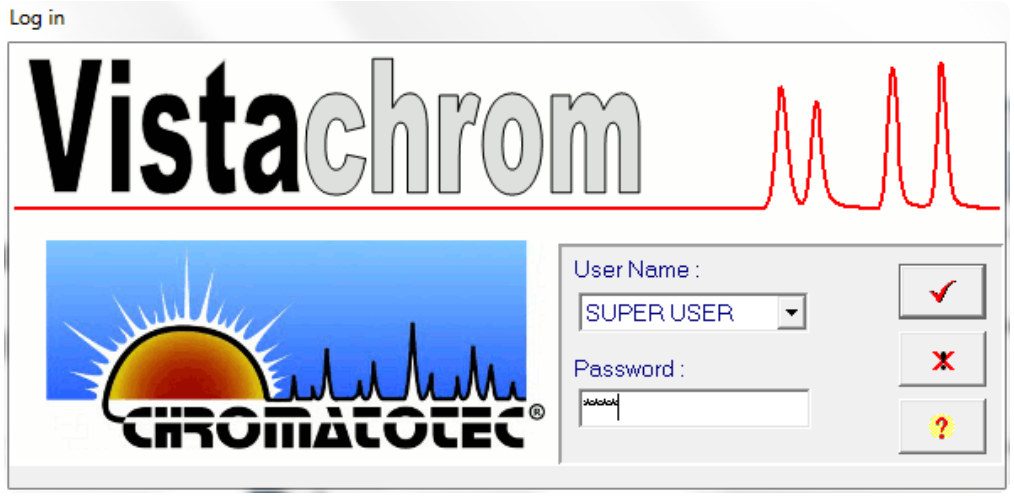
- Full analytical control
- Automatic storage of data (sample gas and calibration results)
- Visualization of the results obtained
- Full traceability for quality and audit trail purposes
- Real-time results transmitted via standard transfer protocols

Software – Log in



Vistachrom Log in

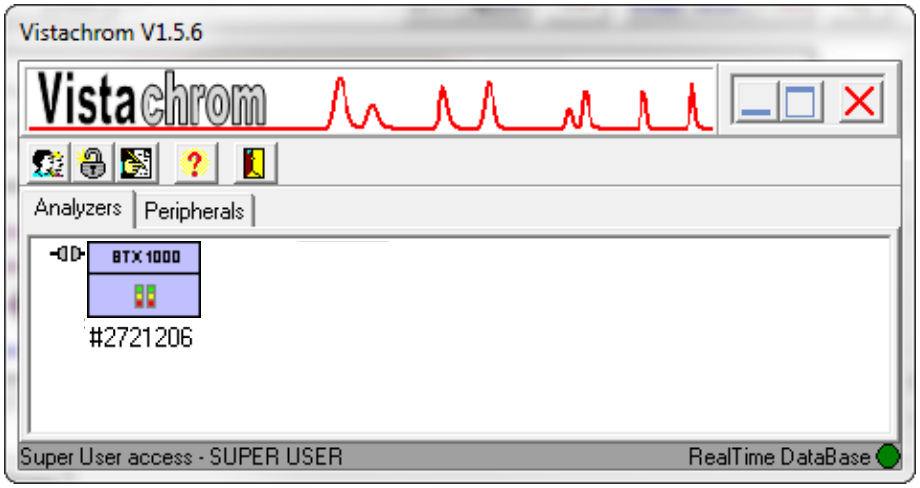
- End user
  - Login : “SUPERUSER”
  - Password : “1234”
- Distributor
  - Login : “DISTRIB”
  - Password : “6789”



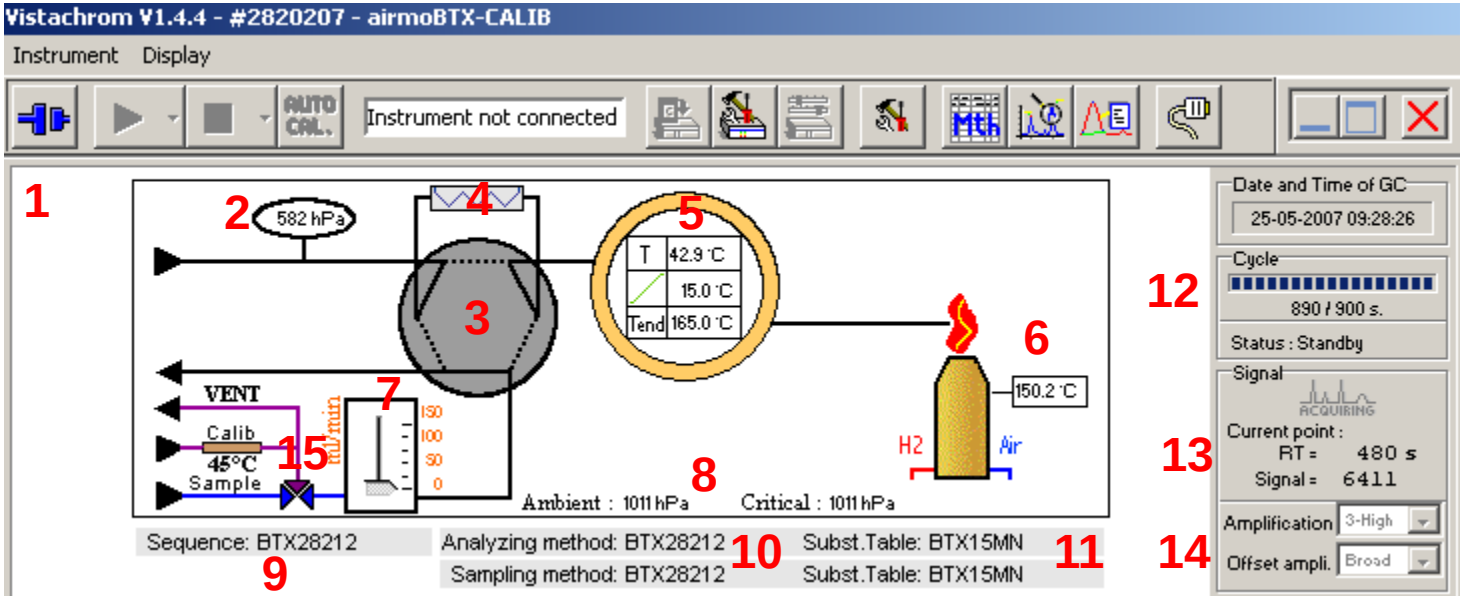
Software – “Main Window”

Main Window

- Each GC is identified by the serial number
- Double-click on the SN to open the “GC Window”



Software – “GC Window”



1: Icon to establish the communication with the PC

2: Head column PRESSURE.

3: State of the injection valve

4: trap thermodesorption state (red if active)

5: Oven temperature

6: FID detector temperature

7: Sampling flow

8: Ambient and critical pressures

9: Sequence

10: Methods (sampling / analyzing)

11: Substances table

12: Cycle and acquisition times

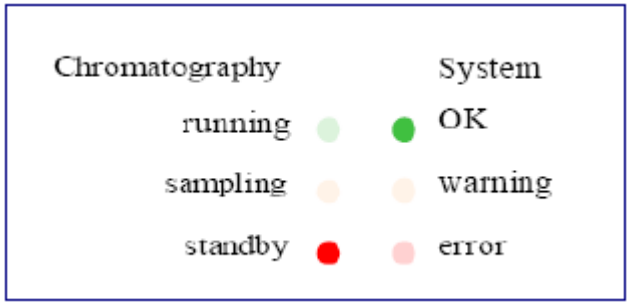
13: Signal value and retention times during the acquisition

14: Electrometer and Offset amplification

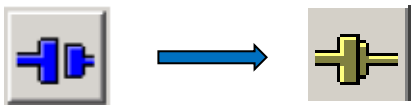
15: Solenoid valve for the selection of the internal system calibration

Software – Log on

- GC and computer must be ON
- LEDs on the front panels : “stand by” and “OK” are ON



- For analyzers manufactured before 2020:
  COM port is used for the communication GC-PC (usually COM3)
- For analyzers manufactured after 2020:
  IP address is used for the communication GC-PC (usually 192.168.100.200)



- Press on this icon to establish the communication GC-PC

Software – Before starting a cycle

Verifications to do, before starting the first cycles

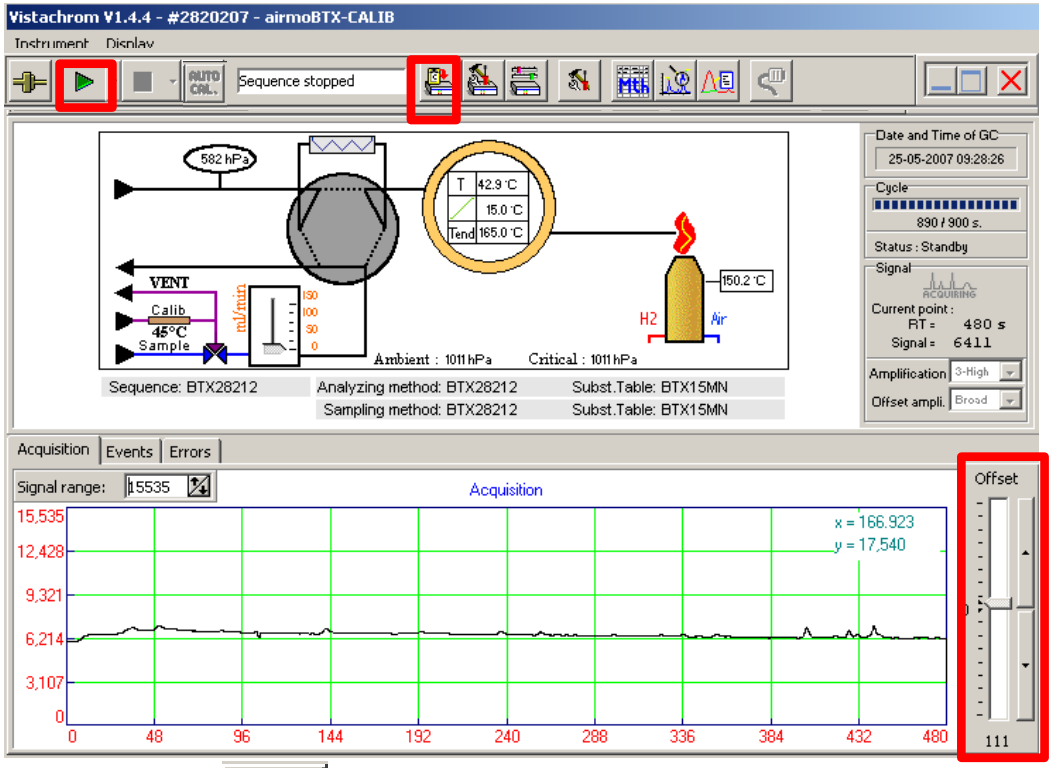
On the software:

- Head column pressure
- Column temperature in stand by
- Difference between Ambient Pressure and Critical pressure (hPa) in sampling mode
- Detector temperature
- Calibration oven temperature

Physically on the instrument:

- Were the gas generators purged for one hour?
- Is the pump ON?
- Sampling flow measurement
- Check the gas inlet pressures
- On the FID : check H2 and air flows
- Check FID flame is on
- Calibration flows measurements
- Install the permeation tube in the oven

Software – Analysis start



- Upload the sequence
- Click on to start the analysis. The first acquisition will be at the second analysis cycle. Check if during the acquisition, base-line signal is at about 3000, control with signal offset control

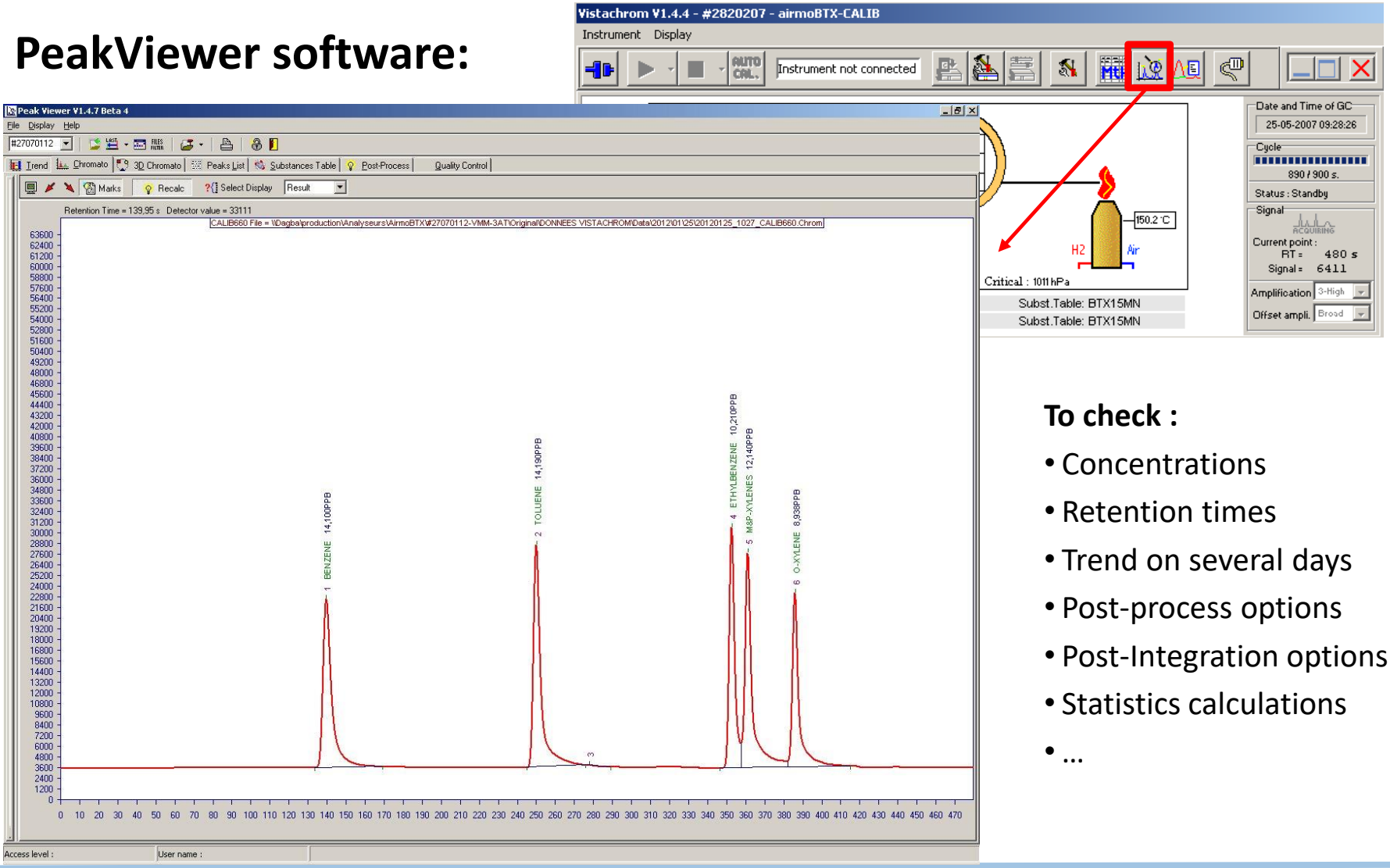
Software – Data storage

Data storage:

- Data is stored as raw chromatograms and ASCII files (Excel)
- Data files are recorded and stored with date, time, and method stamp
- Data can be transmitted to data acquisition system via Modbus protocol, 4-20mA module, …

Software – View chromatograms

PeakViewer software:



To check :

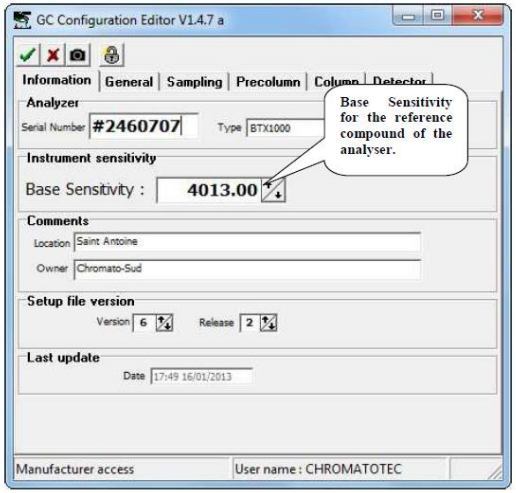
- Concentrations
- Retention times
- Trend on several days
- Post-process options
- Post-Integration options
- Statistics calculations
- …

Calibration: FID

Base Sensitivity (BS) parameter:

All instruments are calibrated with a sensitivity factor called Base Sensitivity (BS).

On airmoVOC analyzers, Benzene has a linear response



How is the Base Sensitivity (BS) calculated with an FID?

$$BS = \frac{RF.Area}{C.V}$$

Parameter	Unit	Name	Remark
BS	**au/ng**	Base Sensitivity	BS is used to know the sensitivity of an instrument
RF	**None**	Response Factor	RF is a constant value, displayed in the substance table, for each chemical compound
Area	**au**	Area below a peak	Area displayed below each peak on a chromatogram
C	**mg/m3**	Concentration	
V	**mL**	Volume sampled through the trap	V is displayed for each chromatogram, in PeakList

Calibration: PID

Base Sensitivity (BS) parameter:

On airTOXIC analyzers, VOC do not have a linear response function.

$$C = a\left(\frac{Area}{BS}\right)^{b}$$

a and b optimized experimentally
to pass the linearity test of EN_14662-3 2015

For Benzene:

$$\boxed{C = 1{,}1\left(\frac{Area}{BS}\right)^{0{,}9}}$$

Calibration: PID

To use the « autoCal » option on Vistachrom:

Edit substances table

Substances table information

Substances table name: CAL-30MN

Author: Chromato-Sud

For the analyzer serial number: #22120221

Analyzer type: airTOXIC-CALIB

Substances

#	Name	RT Min	RT Max	Select Peak	GC Result formula	With X=
1	BENZENE-STD	103	113	Middle	X /(0,0523*[SampleVol])	Area
2	BENZENE	103	113	Sum	1,1 *X^0,9	Area/BS

Curve response of detector

Linear Auto-Calibration

X / Conc.

With X = Area + AreaOfs

Name	Value
Conc.	0,0523
AreaOfs	0
Average point N=	1
Min BS	3000
Max BS	55000

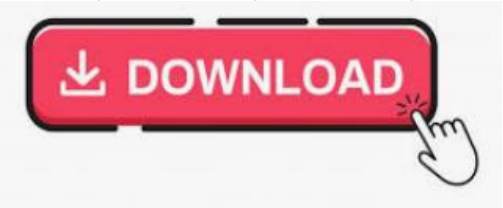
Calibration: PID

Define properly the « autoCal setpoint » concentration

$$C_{1,cor} = \frac{1}{V} * \sqrt[b]{\left(\frac{C_{1,real} * V}{a}\right)}$$

Excel file to calculate $C_{Benzene}$ « corrected »

	A	B	C	D	E	F	G	H
1	Calculation of $C_{1,corr}$							
2		$C_{1,real}$	Volume sampled during a CALIBRATION	$C_{1,corr}$		Modify the blue cells for calculation of $C1_{,corr}$		
3		µg/m3	ml	µg/m3				
4		44,18	104,31	**47,09**				
5								
6		C ppb	**14,49**	à 20°C				
7								



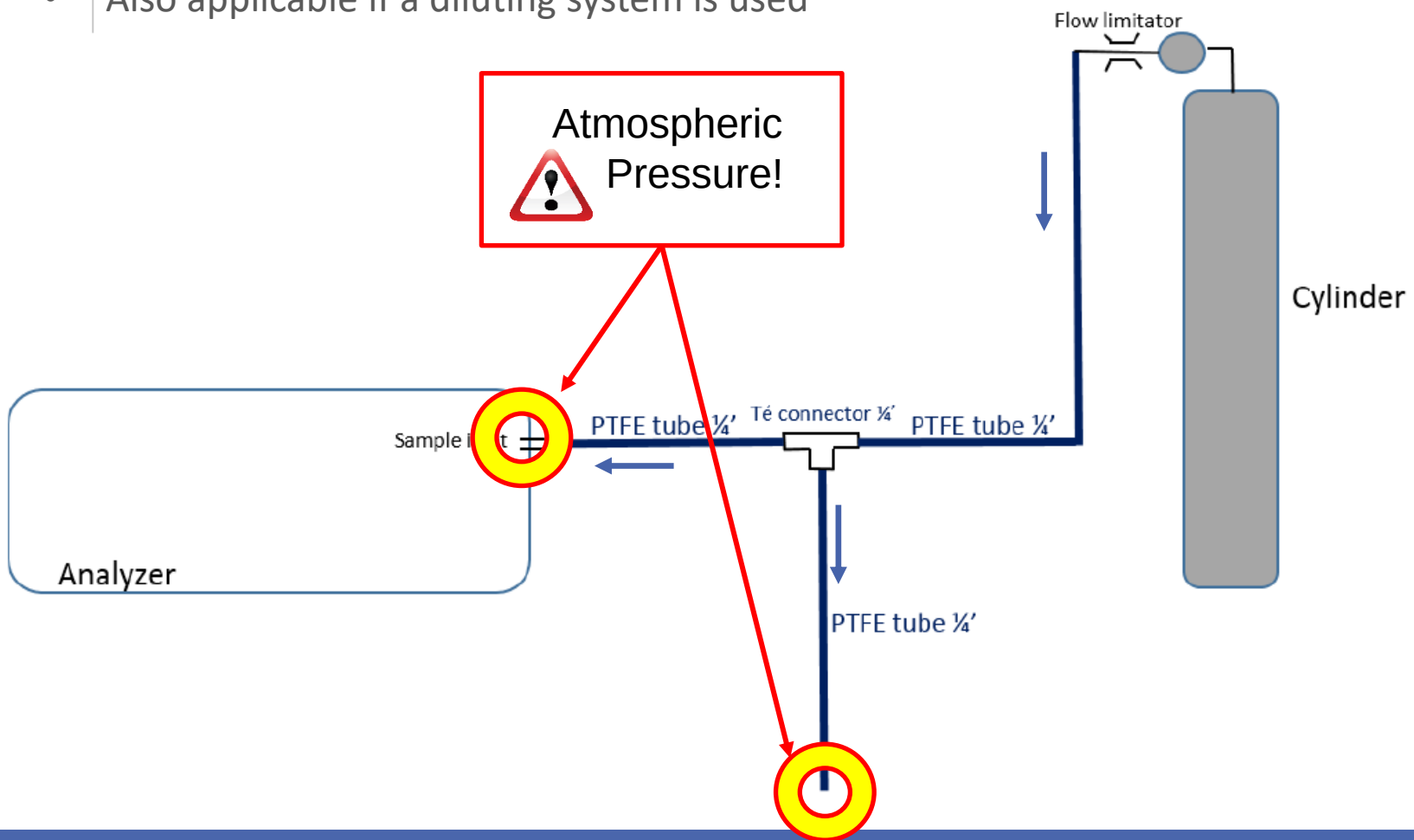
Action to do:

- Everytime you replace the Benzene permeation tube
- Everytime you modify the permeation oven flow

External Calibration

How to connect the external calibration cylinder?

- To obtain good results
- To protect your instrument and not create damages
- Also applicable if a diluting system is used



Service

Every week:

- Check the chromatograms (nice base line, peaks identification, stability of retention times, reasonable BS drift…)

Every month:

- Check the operating parameters : Pressures, flows, temperatures
- Check the BS stability
  - → For PID, if BS is smaller than 3000, clean the lamp

Every year:

- Do the preventive maintenance actions, replacing the PM parts
- Full check of the instrument : Preset, flows, pressures, sensitivity, …

Service – tools required

Tools you absolutely must have:

Classic tool case:
spanners, screwdrivers, …

Leak detector

ELECTRONIC FLOWMETER
(RANGE: 1 - 750 ML/MIN)
(TESTED)
CS_OT_00005-3000

Flowmeter

Several Swagelock fittings
(1/8 and 1/4 size)

Flow regulator

Some meters of PTFE tubes

Tools advised for advanced users (distributors):

TRAP TOOL FOR PRESET FOR CALIBRATION (TESTED)
CS_OT_00012-0001

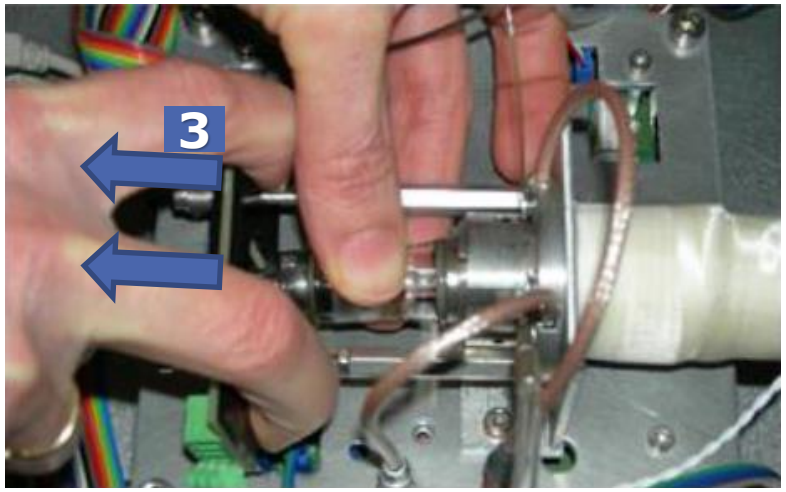
ELECTRONIC MANOMETER ASSY (RANGE: -1 À 2 BARS (RELATIVE PRESSURE)) (TESTED)
CS_SE_00007-MANO

MULTIMETER WITH THERMOCOUPLE K OPTION (TESTED)
CS_OT_00016-0000

CALIBRATION RESISTORS SET FOR TEMPERATURE PRESET (TESTED)
CS_EL_00010-0001

Service – Clean PID lamp

→ To be done every time the PID Base Sensitivity is too low



1. Switch OFF the instrument
2. Remove the HV cable
3. Press the springs and the PID plate to release the lamp
4. Extract the PID lamp from the instrument
5. Use the special abrasive paste and deionised water, to clean the lamp
6. Rince with water
7. Clean with acetone
8. Clean with pure Ethanol
9. Install again the lamp on the PID body
10. Reconnect the HV cable
11. Switch On the instrument

PM kits for FID

« One year PM kit »:

Item number	Designation	Qty
	A21022	
CS_FI_00208-0000	Coalescent filter	1
AR_TU_09007-0000	O-Ring Gasket 4 x 1	2
AR_TU_09104-0000	O-Ring Gasket 6 x 1	1
AR_TU_09002-0000	O-Ring 1.5 x 0.75 mm Nitril	20
AR_EL_05019-0000	Ignitor Assy FID New	1
CS_PN_00005-0106	Rotor 6 ports 1/8" HT	1
	Airmopump	
EP_SA_00004-0001	Membran and valves Kit airmoPUMP	1

« 2 years PM kit »:

Item number	Designation	Qty
	Calibration	
CS_CH_01100-2014	Permeation tube Benzene - around 15 ng/min at 40°C (airmotec certified at ± 10%)	1
CS_TU_09000-0000	O-ring OR 22.5 x 1.5	1

« 3 years PM kit »:

Item number	Designation	Qty
	A21022	
AR_EL_01033-0000	Set of fuses (3 x 3,15A - 1A - 315mA - 50mA)	1
AR_ME_05018-0000	Compl. Nozzle	1
AR_SA_05157-0000	Trap for airmoVOC C6-C12 or BTEX	1
CS_PN_00004-0024	Distributor 24V	1
CS_PN_00005-0002	Pneumatic actuator 6 port	1
	Internal PC	
GC_CP_00001-0001	Fan (int) (Only for MK1 and MK2 computer)	1
IT_CP_00340-0128	Hard disk 128Go SSD 2,5 (SATA connection) since 03/2012	1

« 5 years PM kit »:

Item number	Designation	Qty
	A21022	
CS_CT_01000-CPUT	CPU Board, tested, Incl. Memory supply and H8	1
CS_SE_05015-0001	Column Oven Fan 24V DC 119*119 mm	1
CS_PN_06331-0341	3-way solenoid valve stainless steel (1/8")	1

PM kits for PID

« One year PM kit »:

Item number	Designation	Qty
	airTOXIC-CALIB	
AR_TU_09002-0000	O-Ring 1.5 x 0.75 mm Nitril	20
CS_FI_00208-0000	Coalescent filter	1
CS_PN_00005-0106	Rotor 6 ports 1/8" HT	1
AR_TU_09007-0000	O-Ring Gasket 4 x 1	2
AR_TU_09104-0000	O-Ring Gasket 6 x 1	1
	airmoPUMP	
EP_SA_00004-0001	Membran and valves Kit airmoPUMP	1

« 2 years PM kit »:

Item number	Designation	Qty
	Calibration	
CS_CH_01100-2014	Permeation tube Benzene - around 15 ng/min at 40°C (airmotec certified at ± 10%)	1
CS_TU_09000-0000	O-ring OR 22.5 x 1.5	1
	PID lamp	
CS_DE_00009-106V	PID Lamp - 10.6 eV. Tested airmotec	1

“3 years PM kit”:

Item number	Designation	Qty
	airTOXIC-CALIB	
CS_PN_00005-0002	Pneumatic actuator 6 port	1
AR_SA_05157-0000	Trap for airmoVOC C6-C12 or BTEX	1
CS_PN_00004-0024	Distributor 24V	1
AR_EL_01033-0000	Set of fuses (3 x 3,15A - 1A - 315mA - 50mA)	1
	Internal PC	
GC_CP_00001-0001	Fan (int) (Only for MK1 and MK2 computer)	1
IT_CP_00340-0128	Hard disk 128Go SSD 2,5 (SATA connection) since 03/2012	1

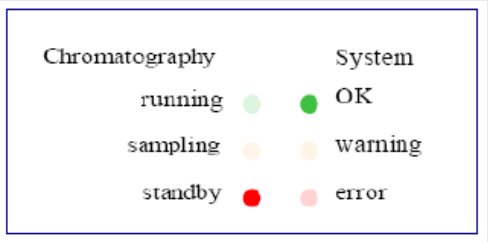
“5 years kit”:

Item number	Designation	Qty
	airTOXIC-CALIB	
CS_CT_01000-CPUT	CPU Board, tested, Incl. Memory supply and H8	1
CS_SE_05015-0001	Column Oven Fan 24V DC 119*119 mm	1
CS_PN_06331-0341	3-way solenoid valve stainless steel (1/8")	1

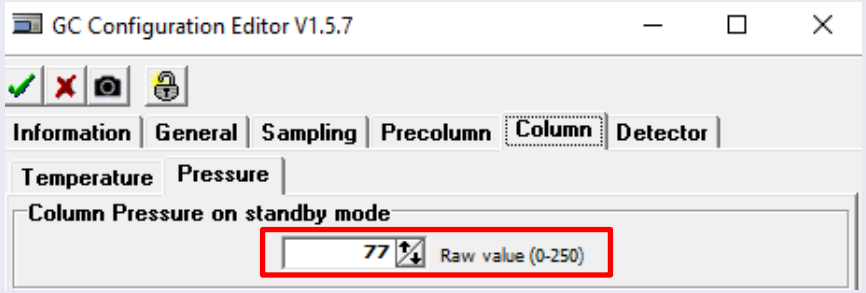
Troubleshooting FID – 1/5

Symptom	Probable cause	Corrective action
No detection, Flat base line	Sample flow is not correct	Switch on the sampling pump Measure the sampling flow with a flowmeter
	No ignition of the flame (no condensation createad at the FID outlet)	Check quality of gas (H2 and zero air) and check purge of gas was done before connecting them to analyzer Gas flows feeding FID are out of range (Good flows should be 180mL/min for air and 27mL/min for hydrogen) Check voltage applied on FID ignitor (should be around 1,8 V ignitor connected) Last option, dismantle FID and check spare parts inside FID
	Issue on the trap : - Trap is unpacked - The trap is never heated	Check visually state of the trap (Gas and analyzer OFF) Check if trap is hot with your finger when thermodesorption is activated Check the trap resistance (should be around 4,1 Ohms) Check that the trap is connected to the power board If you have the specific chromatotec tool, check desorption temperature
	Injection valve does not actuate	Check the Air pressure applied to the GC is 3 bar In stand by, check the ΔP (should be around 20hPa) Be sure the preventive maintenance was done on the valve (rotor, actuator…)
	Bad connection or bad state of electrodes	Check visually state of the electrodes (good spring) Check 2 electrodes are well connected on FID body

Troubleshooting FID – 2/5

Symptom	Probable cause	Corrective action
Impossible to log on	GC is OFF (LEDs OFF on the front panel)	Use the internal power switch to switch On the GC
	COM port used by Vistachrom is not the right one	Change the COM port used by Vistachrom
	Electronic bug	Start a « Hard reset »
	Bad state of LEDs on the front panel	Check the LEDs on the front panel are like in picture below after an hard and soft reset : 
No peak during calibration	No detection, flat baseline	See section « **No detection, Flat base line** »
	Internal calibration gas is not sampled	Check the selection valve (3 ways electrovalve) is working well
	External calibration gas is not sampled properly	Check that your calibration cylinder is connected properly to the GC, using a « te » and a vent
	Internal or external calibration gas is not set properly	Check permanent and dilution flow of internal permeation oven Check flow coming from external calibration gas cylinder

Troubleshooting FID – 3/5

Symptom	Probable cause	Corrective action
Peaks not identified automatically	Very unstable environnement condition	Check the temperature in the lab: it must be stable: 20°C<T<25°C Check air conditionning/ fans are not blowing directly on analyzer Check the quality and the dew point of the gas used (H2 and zero air) Do a clean column during one night
	Wrong head column pressure	Check the Air and H_2 pressure applied on the GC : must be stable at 3 bar for air and 2 bar for H_2 Adjust the Head column Pressure to match with the QC report Open and close piezo valve several times (analyzer in standby, action to do manually : 
	Column temperature needs more stability	Check the RT are stable from a cycle to another Adjust the RT ranges in the substance tables Check « -1°C » is never displayed as the column T Check gradient of temperature is well followed during a cycle

Troubleshooting FID – 4/5

Symptom	Probable cause	Corrective action
Base Sensitivity is not correct	The calibration flow is not correct	Check and adjust the calibration flow
	The permeation oven temperature is not correct	Check the Calib temperature according to the QC report
	The sample flow is not recorded correctly by Vistachrom	Check the sampling flow with an external flow meter Check the sampling flow preset using serviceGC
	Permeation tube is empty	Replace the permeation tube : every year
Concentrations values incorrect	Wrong flow on the internal calibration oven	Using an external flowmeter, measure and adjust if need the flows crossing the calibration module. Don't forget to swith OFF the sampling pump during this flow measurment.
	Wrong temperature of the internal calibration oven	Check the oven calibration oven temperature to be in conformity with the QC report
	External calibration gas is not sampled properly	Check that your calibration cylinder is connected properly to the GC, using a « te » and a vent. Check the sample and the calibration gas are provided at AMBIENT PRESSURE!

Troubleshooting FID – 5/5

Symptom	Probable cause	Corrective action
Unwanted peaks are visible	Presence of artefacts on signal	Check there is no vibration on the GC (pump, compressor… far from analyzer) Check the quality and the dew point of the gas used (H2 and zero air)
	Pollution of the carrier gas / Pollution of the column / Trap polluted	Check the purity of the carrier gas used (purge your gas) Start a « CLEAN » sequence during one night, to remove the pollutions
	Pollution in the injection valve	Clean the rotor with deionised water, in the ultrasons bath Replace the rotor Clean the head of the injection valve
The baseline is noisy	Detector malfunctionning	Check the quality and the dew point of the gas used (H2 and zero air) Check the FID electrodes are well connected Check there is no electrical contact between the two electrodes Check there is no electrical contact between the electrodes and the column
	Detector is vibrating	Check there is no vibration on the GC
Other strange phenomenons	Hardware/software bug	Start a Hard reset and a Soft Reset, following Chromatotec procedures

Troubleshooting PID – 1/3

Symptom	Probable cause	Corrective action
No detection, Flat base line	Sample flow is not correct	Switch on the sampling pump Measure the sampling flow with a flowmeter
	The lamp never turns ON	Check that the PID lamp is properly installed Check the HV cable is connected on the PID plate Check the lamp is not too old (> 2 years)
	The trap is never heated	Check if trap is hot with your finger when thermodesorption is activated Check the trap resistance (should be around 4,1 Ohms) Check that the trap is connected to the power board
	Injection valve does not actuate	Check the Air and N_2 pressure applied to the GC : 3 bar mini In std by, check the ΔP (should be around 20hPa) Be sure the preventive maintenance was done on the valve (rotor, actuator…)
No peak during calibration	PID lamp is dirty	Clean the lamp, following Chromatotec procedure
	No detection, flat baseline	See section « **No detection, Flat base line** »
	Internal calibration gas is not sampled	Check the selection valve (3 ways electrovalve) is working well
	External calibration gas is not sampled properly	Check that your calibration cylinder is connected properly to the GC, using a « te » and a vent

Troubleshooting PID – 2/3

Symptom	Probable cause	Corrective action
Peaks not identified automatically	Wrong head column pressure	Adjust the Head column Pressure to match with the QC report
	Column temperature problem	Check the temperature in the lab: it must be stable: 20°C<T<25°C Adust the RT ranges in the substance tables Check the RT are stable from a cycle to another
Retention times fluctuating too much from a cycle to another	Head column pressure not stable	Check the Air and N2 pressure applied on the GC : must be stable at 3 bar
	Column temperature problem	Check the temperature in the lab: it must be stable: 20°C < T < 25°C Check Air Conditionning is not blowing directly on the GC Check the column T in std by mode Check « -1°C » is never displayed as the column T
Concentrations values incorrect	« Auto-Cal » option is not actived	Activate « Auto-Cal » option Be sure one calibration is done every day (at least!) Check the BS is in the acceptable BS range (see calib substance table)
	Wrong flow on the internal calibration oven	Using an external flowmeter, measure and adjust if need the flows crossing the calibration module. Don't forget to swith OFF the sampling pump during this flow measurment.
	Wrong temperature of the internal calibration oven	Check the oven calibration oven temperature to be in conformity with the QC report
	External calibration gas is not sampled properly	Check that your calibration cylinder is connected properly to the GC, using a « te » and a vent. Check the sample and the calibration gas are provided at AMBIENT PRESSURE!

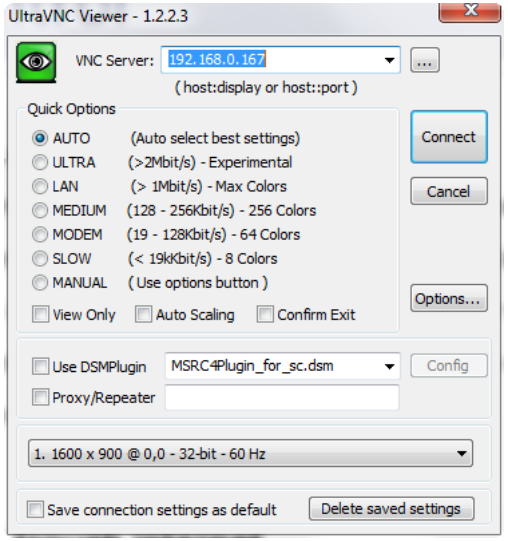
Troubleshooting PID – 3/3

Symptom	Probable cause	Corrective action
Unwanted peaks are visible	Pollution of the carrier gas / Pollution of the column / Trap polluted	Check the purity of the carrier gas used (purge your gas) Start a « CLEAN » sequence during one night, to remove the pollutions
	Pollution in the injection valve	Clean the rotor with deionised water, in the ultrasons bath Replace the rotor Clean the head of the injection valve
The base line is noisy	Detector malfunctionning	Check the PID electrodes are well connected Check there is no electrical contact between the two electrodes Check there is no electrical contact between the electrodes and the column
	Detector is vibrating	Check there is no vibration on the GC
Other strange phenomenons	Hardware/software bug	Start a Hard reset and a Soft Reset, following Chromatotec procedures

Remote control

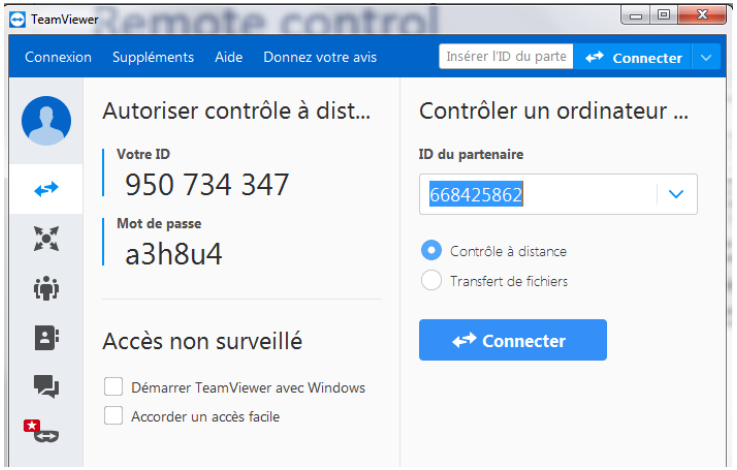
UltraVNC:

- Easy to use for local area connections
- On the Chromatotec computer, the software is automatically started at Windows start up
- On the remote computer, just write the IP address of the Chromatotec computer



TeamViewer:

- Easy to use for connections trough internet
- On the Chromatotec computer, start the software from: D/TeamViewer
- On the Chromatotec computer, write down the IP and password written in TeamViewer
- On the remote computer, just write these ID and password



Options available

Pneumatic options:

- Special calibration module to check the linearity, diluting the standard gas at different ratios
- Special calibration module do dilute the calibration gas with a Mass Flow Controller
- Special inlet dedicated to an external calibration cylinder
- Use several VOC permeation tubes in the same oven
- Possibility to sample different sample streams (multiplexing system)

Sampling options:

- Purge module to extract VOC from water for online VOC in water analysis

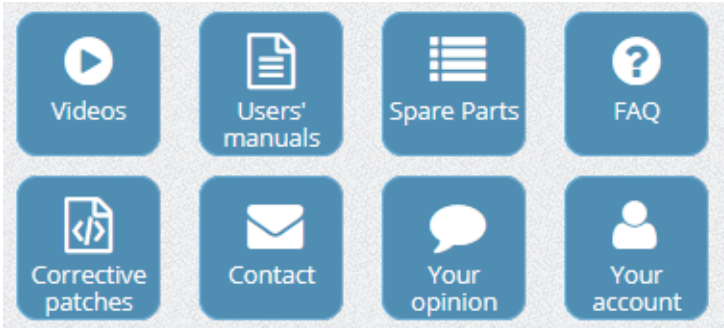
Upgrades:

- airmoVOC C6C20+ for more VOCs
- DET QMS for online GCMS

Visit our technical website

We highly recommend you to have a look to our technical website.

https://support.chromatotec.com/



It is really helpful to:

- ✓ Start
- ✓ Understand the GC functioning
- ✓ Calibrate
- ✓ Maintain
- ✓ Solve a problem

Merci!

Thanks for choosing the airmoVOC BTEX and airTOXIC!

Other Visio-training sessions are available on our website